

REMARKS

The new claims are supported by the specification and the priority document.

Applicants enclose the handout from a talk Solutia gave on phosphate ester hydraulic fluids at the Symposium on Aerospace Fluid Power, Actuation and Control Technologies (SAE Committee A-6) in Palm Springs, CA on October 14, 1998. Applicants believe that this presentation shows that Solutia and their inventor Deetman did not foresee or design for the present invention in their patent (RE37,101).

Respectfully submitted,



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☒ Pursuant to 37 CFR 1.34(a)

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Phosphate Ester Hydraulic Fluid Performance at Higher Pressure

Terry C. Wolfe
Solutia
14 October 98

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P. E. Hydraulic Fluid History

I. First introduced in 1948

II. Product Types

A. Type I

- Improved low temperature viscosity

B. Type II

- Erosion resistance - *water*

C. Type III

- Improved thermal stability

D. Type IV

- Improved thermal stability/erosion resistance

E. Type V

- Higher thermal stability

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State of the Art

I. Type IVs

A. In use today

B. Fluids

1. Skydrol LD-4
2. Skydrol 500B-4
3. Hyjet IVA+

C. Performance Characteristics

1. Fire resistant
2. Erosion resistant to 225F
3. Operation to 250F
4. 3000 psi operation
5. Density: 1 to 1.06 g/cc

II. Type V

A. Qualification/Commercialization

B. Performance Characteristics

1. Fire resistant
2. Erosion resistant to 275F
3. Operation to 275F
4. 3000 psi operation
5. Density: 0.97 to 1 g/cc

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High Pressure Considerations

I. Fire Resistance

A. No change

B. Characteristics

1. Difficult to ignite
2. Self extinguish
3. Will not spread fire

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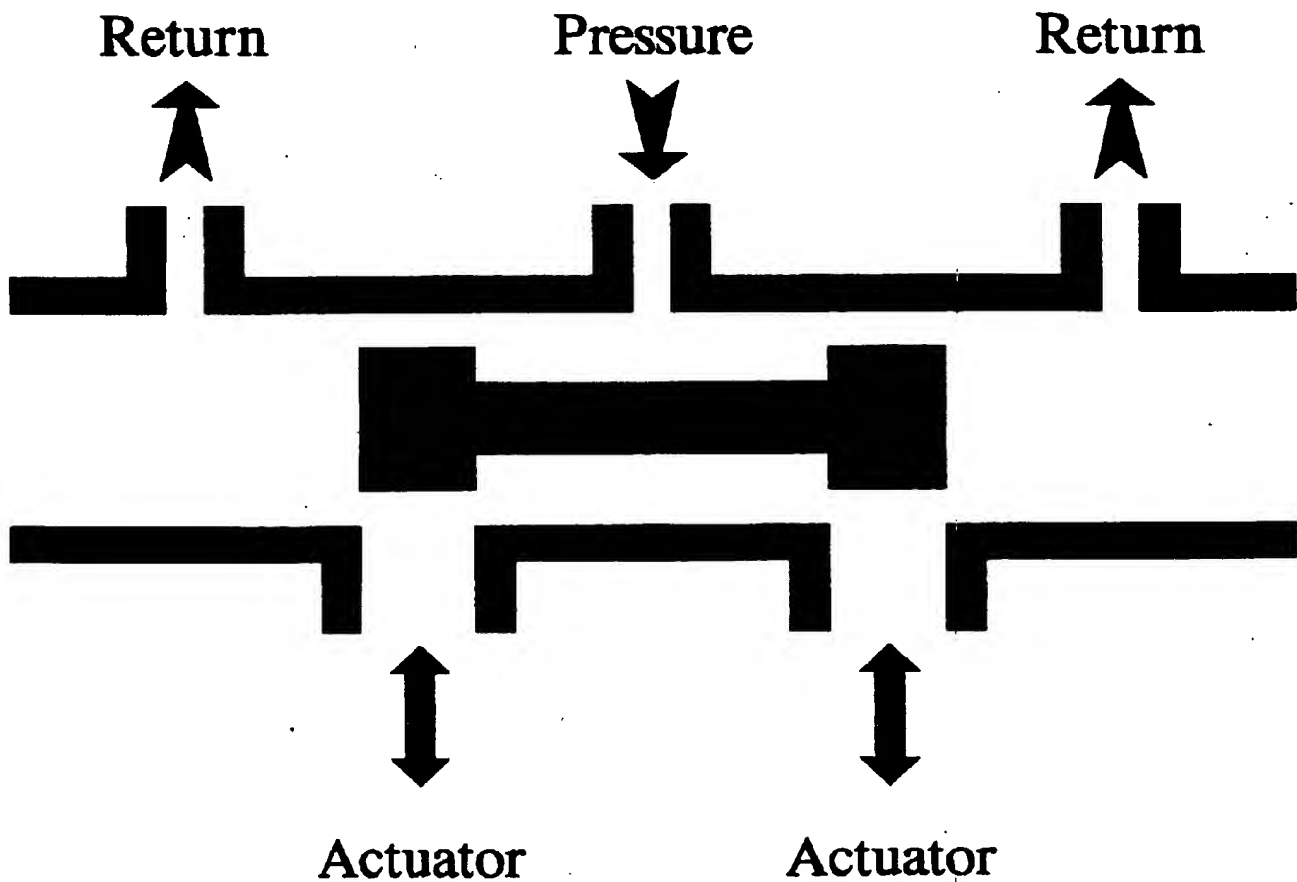
High Pressure Considerations

II. Erosion Resistance

A. Erosion

1. 'Streaming current induced corrosion'
2. Occurs at orifices
3. Controlled by additives

B. Control must be tested at higher pressures



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High Pressure Considerations

III. Thermal Stability

A. Operational temperatures

1. Continuous operation

2. Hot spots

B. Fluid life

C. Temperature limits

IV. Density

A. Weight savings

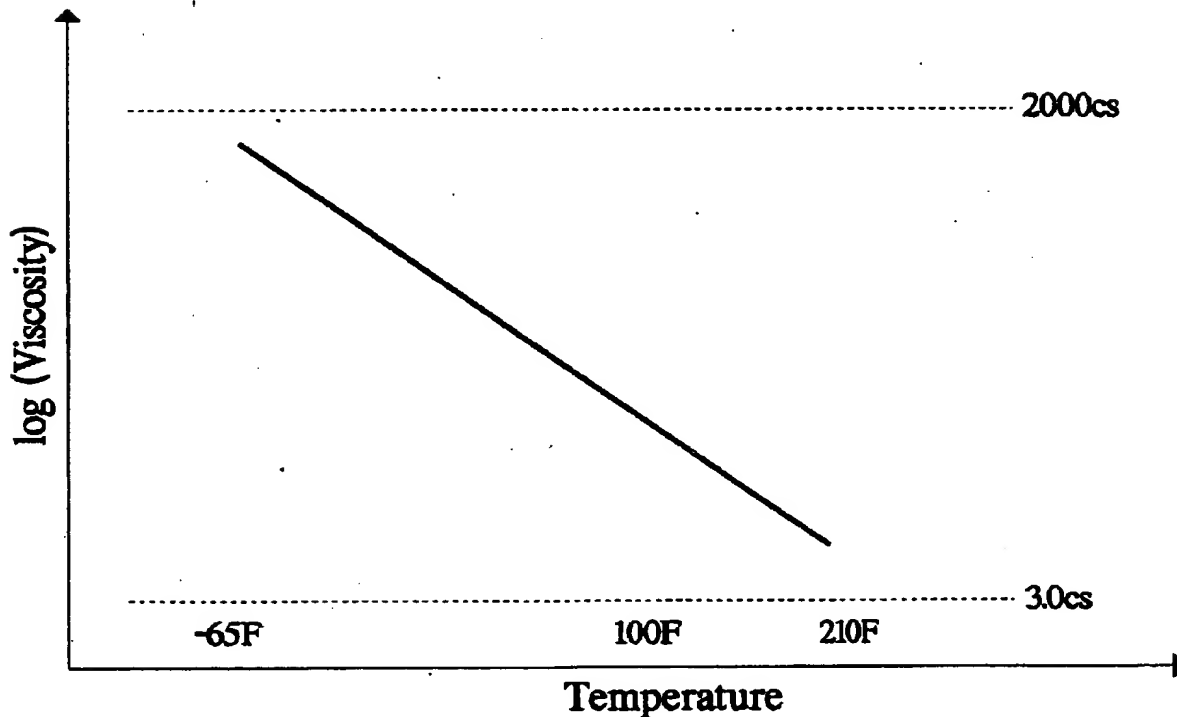
B. Practical limits

V. Elastomers

VI. Viscosity

A. Fluid shear

B. Operational limits



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Steps to a High Pressure Fluid

I. Basic fluid requirements

II. Develop a preliminary specification

III. Test existing fluids

IV. Reformulate if necessary

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